



STATEMENT OF BASIS

LANDFILL NO. 1 SOLID WASTE MANAGEMENT UNIT NO. 25 45TH SPACE WING CAPE CANAVERAL AIR FORCE STATION BREVARD COUNTY, FLORIDA



PURPOSE OF STATEMENT OF BASIS

This Statement of Basis (SB) has been developed in order to inform the public and give the public an opportunity to comment on a proposed remedy to clean up contamination at Landfill No. 1. A 45th Space Wing (45th SW) installation restoration partnering (IRP) team consisting of United States Air Force (USAF), United States Environmental Protection Agency (USEPA), the State of Florida Department of Environmental Protection (FDEP), the U. S. Army Corps of Engineers, and various environmental consultants have determined that the proposed remedy is cost effective and protective of human health and the environ-

Brief Site Description

Landfill No. 1 is a 24-acre site located south Building 66330 on the west side of CCAFS (See Figure 1). The area was used for waste disposal and burning between 1950 and 1969.

ment. However, prior to implementation of the proposed remedy, the 45th SW IRP team would like to give an opportunity for the public to comment on the proposed remedy. At any time during the public comment period, the public may comment as described

in the "How Do You Participate" section of the SB. Upon closure of the public comment period, the 45th SW IRP team will evaluate all comments and issues raised in the comments and determine if there is a need to modify the proposed remedy prior to implementation.

WHY IS CLEANUP NEEDED?

The results of the Remedial Investigation (RI) indicated that several metals, a volatile organic compound (VOC) and a pesticide (listed in

Table 1) are present in the groundwater at levels which could be

potentially harmful to human health.
Additionally, metals and a polychlorinated biphenyl (PCB) are present in the surface soils at levels that could be potentially harmful to human health.

HOW DO YOU PARTICIPATE?

The 45th SW IRP team solicits public review and comment on this SB prior to implementation of the proposed remedy as a final remedy. The final remedy for Landfill No. 1 will eventually be incorporated into the Hazardous and Solid Waste Amendments (HSWA) Permit for Cape Canaveral Air Force Station (CCAFS).

The Clean-up Remedy

The proposed clean-up remedy for Landfill No. 1 includes (but is not limited to) the following components:

- Natural attenuation of groundwater to remove contaminants through natural processes, primarily biodegradation
- Implementation of land use controls designed to prevent exposure to site contaminants. These include:
 - Prohibition of residential development
 - Prohibition of groundwater as a drinking water source
 - Protection of site workers from soil exposure
 - Periodic monitoring of groundwater to document water quality and contaminant levels
 - Posting warning signs on-site

A complete list of land use controls and other protective measures are found in the Landfill No. 1 Land Use Control Implementation Plan (LUCIP).

The public comment period for this SB and the proposed remedy will begin on the date that a notice of the SB's availability is published in a major local newspaper of general circulation. The public comment period will end 45 days thereafter. If requested during the comment period, the 45th SW IRP team will hold a public meeting to respond to any oral comments or questions regarding the proposed remedy. To request a hearing or provide comments, contact the following person in writing within the 45-day comment period:

Mr. Jorge Caspary FDEP-Bureau of Waste Cleanup 2600 Blair Stone Road, MS-4535 Tallahassee, FL 32399-2400 E-mail: Jorge.Caspary@dep.state.fl.us Telephone: (850) 921-9986

The HSWA Permit, the SB, and the associated Administrative Record, including the RI Report, will be available to the public for viewing and copying at:

Environmental Management, CEV/ESC Facility 1638, Samuel Phillips Parkway Cape Canaveral Air Force Station, FL For public access call (321) 853-0965

This information can also be found on-line at http://www.mission-support. org/45SW IRP EA

The HSWA Permit, the SB, and Landfill No. 1 Report summaries will be available for viewing and copying at:

Central Brevard Library 308 Forrest Avenue Cocoa, Fl, 32922

To request further information, you may contact one of the following people:

Ms. Teresa Green Environmental Restoration Element Chief 45 CES/CEVR 1224 Jupiter Street Patrick Air Force Base, FL 32925-3343 E-mail: teresa.green@patrick.af.mil Telephone: (321) 853-0965

Mr. Jorge Caspary See previous contact information

Mr. Timothy R. Woolheater, P. E. EPA Federal Facilities Branch Waste Management Division Sam Nunn Atlanta Federal Center 61 Forsyth Street Atlanta, GA 30303-8960 E-mail: woolheater.tim@epamail.epa.gov

Telephone: (404) 562-8510

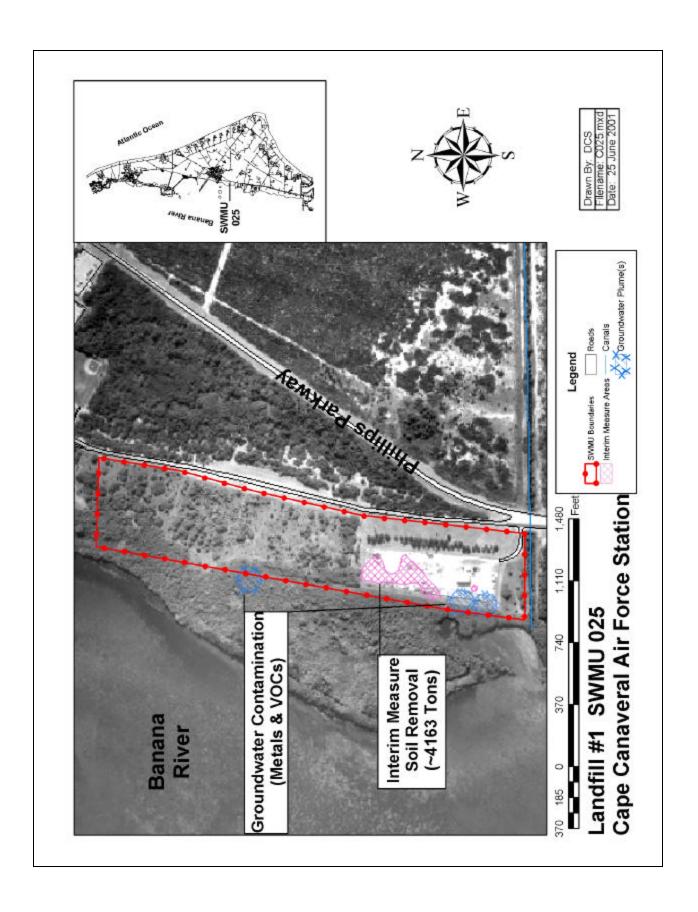
FACILITY DESCRIPTION

USAF established the 45th SW as the primary organization for the Department of Defense aerospace force programs. Historically, the National Aeronautics and Space Administration (NASA) also performed space launch related operations on the 45th SW property. These operations have involved the use of toxic and hazardous materials. Under RCRA and the HSWA Permit (CCAFS Permit No. FL2800016121) issued by the USEPA, the 45th SW was required to perform an investigation to determine the nature and extent of contamination from Solid Waste Management Unit (SWMU) No. 25, Landfill No. 1.

SITE DESCRIPTION AND HISTORY

Landfill No. 1 is a 24-acre site located on the west side of CCAFS, south of Building 66330 (See Figure 1). A strip of dense vegetation bordered by the Banana River is to the west of the site. Hangar Road borders the eastern side and may currently overlay a portion of the former burn pits. The Defense Reutilization and Marketing Office (DRMO), an active facility, is on the south portion of the site.

Landfill No. 1 operated from 1950 to 1969 and was used for disposal and burning of wastes generated at CCAFS. Between 1950 and 1958, metal debris and materials were buried in



isolated pits. From 1958 to 1969, wastes were burned in burn pits. In 1969, ash within the burn pits was compacted and the pits were backfilled with dredge material from the Banana River. Presently, the site is vegetated with grass and trees.

During active landfill activities, wastes disposed and burned at Landfill No. 1 included general solid waste, old equipment, and industrial wastes such as paint thinner, methyl ethyl ketone (MEK), polyurethane acrylic lacquer, paint spoils, paint and pesticide containers, asbestos, and polychlorinated biphenyl (PCB) filters.

The USAF conducted the following investigations:

- 1984: A Phase I Records Search including records review, site reconnaissance, and interviews with knowledgeable personnel identified areas of concerns which warranted further investigation.
- 1986-1988: A Phase II Confirmation/ Quantification investigation was conducted, during which groundwater, soil, and sludge samples were collected. This investigation concluded that the presence of constituents in soil, groundwater, surface water and sediment might pose a risk to human health and the environment. The Phase II investigation recommended that a Phase III Investigation (RI) be conducted to assess the nature and extent of the contamination present at the site, and perform risk assessments to determine if contamination is detrimental to human or ecological health.
- 1998: An Interim Measure was performed to remove lead- and PCB-contaminated soil that exceeded industrial risk-based regulatory criteria. The clean-up action resulted in the removal of approximately 2,973 cubic yards (4,163 tons) of soil.
- 1988-1998: The RI was initiated in 1988 and was documented in a report that also

addressed a number of other sites. This initiative was unable to adequately characterize and assess the contamination at Landfill No. 1. Consequently, a more robust RI was initiated in 1993, detailing the sampling and analysis of site soil, groundwater, surface water, and sediment. These results were used to determine human health and ecological risks. The Human Health Risk Assessment (HHRA) indicated that site groundwater and soil may pose potential risk. The Ecological Risk Assessment (ERA) indicated that no unacceptable ecological risk is present at the site.

1998: A Long Term Monitoring (LTM)
Workplan was submitted in 1998 and LTM
was initiated. The 45th SW IRP team felt it
was incumbent to implement LTM immediately following the RI in order to ensure
that groundwater contaminants were
appropriately monitored and tracked.

SUMMARY OF SITE RISK

As part of the RI activities, an HHRA and an ERA were conducted to estimate the health and environmental risks associated with the site-specific contamination. The risk assessments were performed in accordance with risk management decision processes established by the USEPA, FDEP, and the USAF at the time the RI was initiated.

The Chemicals of Concern (COCs) identified for human health during the RI were:

- Soil: arsenic, beryllium, cadmium, lead, and aroclor 1260
- Groundwater: arsenic, manganese, vinyl chloride, and alpha-chlordane

The initial RI performed a human health risk assessment for maintenance workers and potential adult and child recreators. The maintenance worker scenario did not present an unacceptable risk or hazard for any of the site media. The potential adult and child recreator

scenarios exceeded the one in one million (1/1,000,000) risk threshold for sediment exposure and fish ingestion. However, following consideration of risk management issues (e.g. relatively low risk, lack of likely contact with the media, and highly conservative assumptions in the risk calculation), it was determined that neither sediment exposure nor fish ingestion pose an unacceptable risk at SWMU No. 25. This conclusion was validated when the risk assessment was revisited in 1998 under current regulatory guidance.

Following additional sampling and completion of a soil removal, a Preliminary Risk Assessment was performed on soil and groundwater in 1998. Soil exceeded the one in one million (1/1,000,000) cancer threshold and the noncarcinogenic hazard index target of 1.0 for the hypothetical future resident scenario and the industrial worker scenario. Under the residential scenario, aroclor 1260 and arsenic were the primary contributors to cancer risk. Arsenic was also the most significant component of cancer risk. Under the industrial scenario, aroclor 1260 was the primary contributor to cancer risk, while lead was the most significant component of cancer risk. Groundwater exceeded the one in one million (1/1,000,000) cancer threshold and the noncarcinogenic hazard index target of 1.0 for the hypothetical future resident scenario and the industrial worker scenario. Arsenic was the primary contributor to both cancer risk and noncarcinogenic hazard.

Based on the risk management decision process, it was determined that beryllium and cadmium in soil and alpha-chlordance in groundwater did not pose an unacceptable risk. Factors considered included: the conservative nature of the risk assessment, the minimal exceedance of threshold risk value for each compound, and the fact that the maximum detected concentrations were much less than the clean-up levels (FDEP Residential Soil Cleanup Target Levels for soil compounds and USEPA Maximum Contaminant Levels for groundwater).

The ERA was conducted to evaluate the possibility that land and aquatic organisms (eco-receptors) may be at risk from site-related contaminants. The ERA was based on laboratory analyses of groundwater, soil, surface water, and sediment samples.

The ERA concluded that potential risk from the exposure to and/or ingestion of groundwater, soil, surface water, or sediment by ecoreceptors is marginal. Several factors mitigate the potential concern. These could include routine facility operation and maintenance activities, less than optimal habitat found within facility boundaries, the extent of the ecoreceptor's normal foraging area, and the seasonal variability associated with the amount of surface water present at any given time.

WHAT ARE THE CLEANUP OBJECTIVES AND LEVELS?

The remedial action objectives (RAOs) are to:

- Protect humans from exposure to shallow groundwater and prevent consumption of groundwater from the shallow aquifer (where contaminant concentrations are higher than regulatory standards), and
- 2) Prevent unacceptable human contact with site soils that exceed regulatory standards for residential site use.
- 3) Ensure that workers are adequately protected when performing tasks that may result in exposure to site soils.

Table 1 lists the COCs present at Landfill No.

1. The first column lists the chemical name, the second column lists the maximum concentration detected in the impacted media at Landfill No. 1 during the RI, and the last column presents the clean-up level to be achieved at the site.

Please note that through the risk management decision process, several contaminants originally designated as COCs were determined not to pose an unacceptable risk (See Summary of Site Risk") and are therefore not included in the remedial action.

TABLE 1—CLEANUP GOALS

Site-Related Chemicals of Concern (COCs)	Maximum Detected Concentration	Site-Specific Clean-up Level ¹	
GROUNDWATER			
Arsenic	93 ug/L	6 ug/L	
Manganese	250 ug/L	50 ug/L	
Vinyl Chloride	1.8 ug/L	1.0 ug/L	
SOIL			
Arsenic	3.5 mg/kg	0.8 mg/kg	
Lead	429 mg/kg	400 mg/kg	
Aroclor 1260	3.3 mg/kg	0.5 mg/kg	

¹ Clean-up level represents the most stringent value among USEPA and FDEP criteria at the time of the final investigation.

CLEANUP ALTERNATIVES FOR LANDFILL NO. 1

Clean-up alternatives are different combinations of plans to restrict site use and to contain, remove, and/or treat contamination in order to protect public health and the environment. Only two alternatives were considered because of low levels of contamination present at the Landfill No. 1. The clean-up alternatives considered for the Landfill No. 1 ar summarized below.

No Action: Evaluation of the No-Action alternative is used as a basis for comparison with other alternatives. Under this alternative, no remedial action would be taken to reduce human health risks or restrict site use. No monitoring of COC concentrations in the groundwater would be performed. It was determined this alternative would not attain the RAOs.

Land Use Controls and Natural Attenuation with Long Term Monitoring: Under this alternative, material processes such as biological degradation, dispersion, advection, and adsorption would reduce COC concentrations to cleanup levels over time. Groundwater

would be regularly sampled and analyzed to monitor and document the decrease in contaminant concentrations. Data collected during the RI and other Basewide assessments indicate that biodegradation will likely reduce contaminant concentrations below groundwater cleanup levels within 30 years. Additionally, the 45th SW would implement site-specific land use controls to protect against exposure to contaminated soils and shallow groundwater and to prevent consumption of shallow groundwater. In the long term, this remedy alternative will meet RAOs and will also allow re-evaluation to determine if the remedy is working and provide an opportunity for change if necessary. The 45th SW, USEPA, and FDEP have entered into a Memorandum of Agreement (MOA), which outlines how land use controls will be managed at the 45th SW. The MOA requires periodic inspections, condition certification, construction project coordination, and agency notification. Site-specific details can be found in the Landfill No. 1 Land Use Control Implementation Plan (LUCIP).

EVALUATION OF REMEDY ALTERNATIVES

Each cleanup alternative was evaluated to determine how each potential remedy would comply with the four general standards for corrective measures. The four general standards for corrective measures are:

- Overall protection of human health and the environment;
- Attain media cleanup standards;
- Control the sources of releases; and
- Comply with standards for management of wastes

The second alternative (Land Use Controls and Natural Attenuation with LTM) meets each of the above criteria, while the no action alternative remedy would not meet them.

LAND USE CONTROLS AGREEMENT

By separate MOA dated 23 December 1999,

with USEPA and FDEP, CCAFS, on behalf of the Department of the Air Force, agreed to implement base-wide, certain periodic site inspection, condition certification, and agency notification procedures designed to ensure the maintenance by installation personnel of any site-specific land use controls deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the USAF's substantial good-faith compliance with the procedures called for therein, reasonable assurances would be provided to the USEPA and FDEP as to the permanency of those remedies which included the use specific land use controls.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by the USAF, USEPA, and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent on CCAFS's substantial good-faith compliance with the specific land use control maintenance commitments reflected therein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

WHAT IMPACTS WOULD THE CLEANUP HAVE ON THE LOCAL COMMUNITY?

There would be no impacts to the surrounding communities because groundwater underlying the site is not used for potable. The natural attenuation and LTM alternative includes administrative actions to limit the use of groundwater until cleanup levels have been reached. Additionally, residential use of the Landfill No. 1 is not occurring nor is it expected in the near future. As long as CCAFS remains an active gateway for the aerospace industry, Landfill No. 1 is expected to continue operating in an industrial capacity.

Although remaining soil concentrations do not exceed FDEP Industrial Soil Cleanup Target Levels, the human health risk assessment indicated a low-level potential risk to future site workers. Based on this potential risk, land use controls will be put in place to ensure that workers are adequately protected when engaging in activities that require contact with soil.

WHY DOES THE 45th SW IRP TEAM RECOMMEND THIS REMEDY?

The team recommends the proposed remedy because the naturally occurring attenuation process observed at the site (and predicted with Base groundwater models) are sufficient for the removal of low concentrations of contaminants. The LTM program will be used to assess and document reduction in contaminant concentrations to the cleanup goals. The land use controls will also prevent exposure to soil and groundwater contaminants prior to the cleanup levels being achieved.

Although all remaining soil contaminant concentrations are below the FDEP Industrial Soil Cleanup Target Levels, controls are needed to mitigate the low-level risk to site workers that was calculated during the human health risk assessment. In order to be conservative and ensure that workers are adequately protected, the remedy provides controls that will regulate worker exposure and ensure that protective equipment is employed, when warranted. The proposed remedy meets the four general standards for corrective measures.

NEXT STEPS

The 45th SW IRP team will review all comments on this SB to determine if the proposed remedy needs modification prior to implementation and prior to incorporating the proposed remedy into the CCAFS HSWA permit. If the proposed remedy is determined to be appropriate for implementation, then the LTM program will be continued, the land use controls will be implemented, and a LUCIP will be developed and incorporated into the MOA.

In accordance with RCRA Section 7004(b), this Statement of Basis summarizes the proposed remedy for CCAFS Landfill No. 1. For detailed information, consult the Landfill No. 1 RI Report which is available for review at the 45th SW Environmental Management Office (See "How Do You Participate") or on-line at http://www.mission-suppport.org/45SW_IRP_EA.





LAND USE CONTROL IMPLEMENTATION PLAN

LANDFILL NO. 1 SOLID WASTE MANAGEMENT UNIT 25 (SWMU NO. 25) 45TH SPACE WING CAPE CANAVERAL AIR FORCE STATION BREVARD COUNTY, FLORIDA

Facility Description

Landfill No. 1, Solid Waste Management Unit 25 (SWMU No. 25) is a 24-acre site located on the west side of Cape Canaveral Air Force Station (CCAFS), south of Building 66330. A strip of dense vegetation and the Banana River are to the west of the site. Hangar Road borders the eastern side and may currently overlay a portion of the former burn pits. The Defense Reutilization and Marketing Office (DRMO), an active facility, is on the south portion of the site. Landfill No. 1 operated from 1950 to 1969 and was used for disposal and burning of wastes generated at the CCAFS. Between 1950 to 1958, metal debris and materials were buried in isolated pits. From 1958 to 1969, wastes were burned in burn pits. In 1969, ash within the burn pits was compacted and the pits were backfilled with dredge material from the Banana River. Presently, the site includes the DRMO and is otherwise vegetated with grass and trees.

Location	(Reference Site Map on last page of this document)			
	Site Plan Coordinate	Northing	Easting	
	North	1509344.66	788514.90	
	West	1506773.14	787981.60	
	South	1506773.14	788247.78	
	East	1509325.29	788945.82	

Objective

Implementation of site-specific land use controls to protect against exposure to contaminated soil and shallow groundwater, to prevent consumption of the shallow groundwater, and to prevent uncontrolled contact with landfill contents.

Land Use Controls (LUCs) to be Implemented Administrative:

• The property will be prohibited from residential or other non-industrial development without prior written notification to the Florida Department of Environmental Protection (FDEP) and the United States Environmental Protection Agency (USEPA) concerning the SWMU land use change. Dependent on site conditions and the nature

LUCIP LANDFILL 18 (SWMU NO. 25) CAPE CANAVERAL AIR FORCE STATION OCT 2001

and intensity of the proposed land use change, additional site investigations and assessments could be required for the United States Air Force (USAF). Based on these analyses, additional remedial measures may be required prior to land use change.

- Perform and document baseline LUC audit upon finalization of the Statement of Basis.
- Perform and document quarterly LUC compliance inspections in accordance with 45th SW LUC Operations Manual.
- Perform, document, and report an annual audit on LUC implementation, maintenance, and compliance in accordance with the 45th SW LUC Operations Manual and the current CCAFS Corrective Action Management Plan (CAMP).
- In the event of property realignment, transfer, or re-use for non-industrial or non-commercial purposes, assessment and remediation may be necessary to ensure that impacts to ecological receptors are not increased or to mitigate potential ecological impacts where residual contamination exists.

Soil:

- Soils will not be disturbed or moved during property development, maintenance or construction, without:
 - a) USAF review, coordination, and approval of the proposed construction/ development plans via AF Form 103 (Base Civil Engineer Work Clearance Request), 332 (Base Civil Engineer Work Request), 813 (Request for Environmental Impact Analysis), or similar process;
 - b) Ensuring proper engineering controls are in-place so that unauthorized release or disposal of the affected media does not occur. This includes conducting appropriate testing and developing a disposal plan in accordance with the LUC Operations Manual prior to off-site disposal; and
 - c) Use of proper personal protection equipment by site workers, as determined by the project proponent's occupational health and safety advisor.
- The site will be posted with proper warning signs in accordance with the LUC Operations Manual and the CCAFS Hazardous and Solid Waste Amendments (HSWA) Permit.
- The USAF will initiate and maintain a habitat enhancement program in accordance with requirements outlined in the Remedial Investigation and summarized in the LUC Operations Plan.

Groundwater:

- The consumptive use of the site's surficial aquifer groundwater will be prohibited.
- Incidental consumption and dermal exposure to groundwater from the surficial aquifer will be prevented. This will be addressed by the project proponent's health and safety advisor.

LUCIP LANDFILL 18 (SWMU NO. 25) CAPE CANAVERAL AIR FORCE STATION OCT 2001

- Groundwater will not be contacted, pumped, or discharged during property development, maintenance, or construction, without:
 - a) USAF review, coordination, and approval of the proposed construction/ development plans via AF Form 103 (Base Civil Engineer Work Clearance Request), 332 (Base Civil Engineer Work Request), 813 (Request for Environmental Impact Analysis), or similar process;
 - b) Ensuring proper engineering controls are in-place so that unauthorized release or disposal of the affected media (groundwater) does not occur. This includes conducting appropriate testing and developing a disposal plan in accordance with the LUC Operations Manual prior to any pumping or discharge of groundwater; and
 - c) Use of proper personal protection equipment by site workers, as determined by the project proponent's occupational health and safety advisor.
- USAF will institute a long term monitoring (LTM) program of groundwater in the surficial aquifer in accordance with an approved LTM work plan and the CAMP as part of the CCAFS HSWA Permit. Reports will be submitted annually, along with revised work plan recommendations, until such a time as the relevant regulatory agencies agree that contaminant concentrations in groundwater no longer warrant long term monitoring.
- The site will be posted with proper warning signs in accordance with the LUC Operations Manual and the CCAFS HSWA permit.

Landfill:

- Due to the presence of a closed landfill, development, maintenance, and construction is restricted without:
 - a) USAF review, coordination, and approval of the proposed construction/development plans via AF Form 103 (Base Civil Engineer Work Clearance Request), 332 (Base Civil Engineer Work Request), 813 (Request for Environmental Impact Analysis), or similar process;
 - b) Ensuring proper engineering controls are in-place to ensure that the landfill cover is not penetrated and landfill contents are not contacted or released. In the event that the landfill cover is breached, additional remedial measures may be required;
 - c) Ensuring proper engineering controls are in-place to address specialized technical concerns relating to landfill integrity management. These may include: controls for differential settlement, erosion control, surface water run on/off and methane management; and
 - d) Use of proper personal protection equipment by Site workers, as determined by the project proponent's occupational health and safety advisor.

Statement of Basis:

The Statement of Basis (SB) is currently being reviewed. It is anticipated that the SB will be accepted/incorporated into the HSWA Permit, scheduled for issuance early in 2002.

LUCIP LANDFILL 18 (SWMU NO. 25) CAPE CANAVERAL AIR FORCE STATION OCT 2001

Additional Information:

<u>Long Term Monitoring Plan</u>: LTM will be implemented on a annual basis for ground-water. As per the LTM Work Plan, monitoring wells are sampled annually. The scope and magnitude of the LTM program are reviewed and adopted annually based on recent data trends.

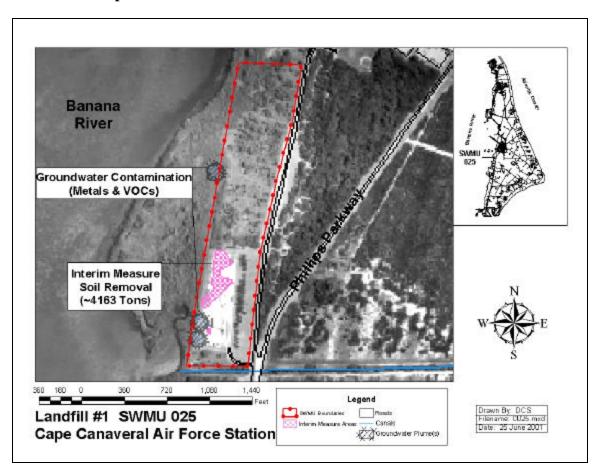
Pertinent Document Reference:

Remedial Investigation/Feasibility Study, Cape Canaveral Landfill-1 (LF-18), SWMU No. 25, O'Brien & Gere Engineers, Inc., April 1998.

Long Term Monitoring Work Plan, Cape Cana veral Landfill-1 (LF-18), SWMU No. 25, BEM Systems, Inc., July 1998.

Semi-Annual Monitoring Report No. 1 (2000-2001), Cape Canaveral Landfill-1 (LF-18), SWMU No. 25, BEM Systems, Inc., March 2001.

LF-18 Site Map



Please contact the 45 SW Installation Restoration Program Office to obtain additional information, including: the 45 SW Land Use Controls Operation Plan; the CCAFS HSWA Permit; a complete record of corrective actions at Landfill No. 1; or other related do cuments, guidance, and regulations. The IRP office can be reached by phone at (321) 853-0965. Information can also be obtained via the IRP website at http://www.mission-support.org/45SW_IRP_EA